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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Volume XXIII Number 13

July 15, 1939

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A SURVEY OF COTTON SEEDLING DISEASES IN 1939 AND THE FUNGI ASSOCIATED WITH THEM

Paul R. Miller and Richard Weindling

To obtain further information regarding the prevalence and relative distribution of the various fungi associated with the damping-off of cotton seedlings, a survey, similar to that of last year, was conducted, using the same methods in collecting the samples, and in culturing and identifying the organisms (Plant Disease Reporter 22: 260-263, July, 1938.

In general, the results obtained this year were very similar to those of 1938.

Table 1 shows the number of samples sent in from each State, and the individuals who cooperated in collecting the seedlings.

Table 1. Number of samples from each State, and collectors.

State	Number of Samples	Collectors
Alabama	49	Miller
Arkansas	34	Miller, Poe
Georgia	84	Borders, Smith, Miller, Barker, Sikes, Gore
Kentucky	5	Miller
Louisiana	60	Miller, Neal, Black
Mississippi	48	Miller
Missouri	5	Miller
North Carolina	20	Lehman, Miller
Oklahoma	17	Ray
South Carolina	104	Miller, Bennett, Boozer
Tennessee	7	Miller, Barker
Texas	4	Dunlap, Rogers
Virginia	25	Fenne
Total	462	

The extent of the survey and the origin of seedling samples are indicated on the map (Fig. 1), which shows the number of samples obtained from different counties in each State.

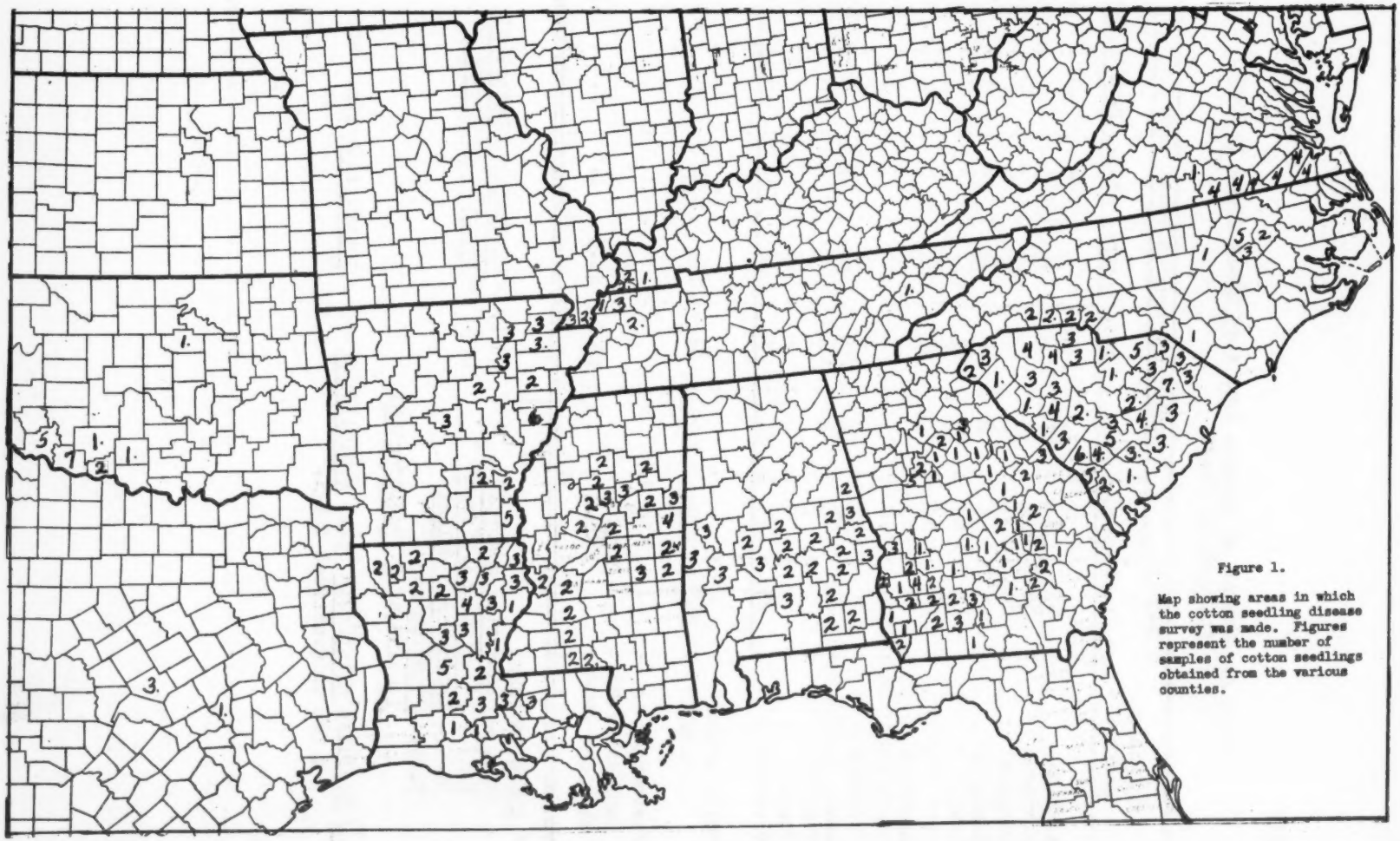

Figure 1.

Map showing areas in which the cotton seedling disease survey was made. Figures represent the number of samples of cotton seedlings obtained from the various counties.

Table 2. Number of samples from each State found to have the various fungi.

Origin of Samples	Number of Samples	Number of Samples Found with * G.g.	F.m.	Rh.s.	F.spp.	Rh.b.	D.g.	Other Fungi a/
Alabama	49	49	47	8	2	0	0	12
Arkansas	34	33	33	7	21	1	1	18
Georgia	84	79	80	10	18	4	1	46
Kentucky	5	4	4	0	1	0	0	5
Louisiana	60	60	55	17	39	1	0	33
Mississippi	48	47	38	6	30	5	0	23
Missouri	5	5	5	0	2	0	0	1
North Carolina	20	16	13	1	13	5	3	15
Oklahoma	17	0	6	0	5	2	1	16
South Carolina	104	90	96	12	40	2	4	67
Tennessee	7	7	6	0	6	0	0	3
Texas	4	0	0	0	4	0	0	3
Virginia	25	23	24	0	10	1	0	14
Total number samples	462	413	407	61	191	21	10	256
Percentage of samples found with the fungi		89.4	88.1	13.2	41.3	4.5	2.2	55.4

* Abbreviations:

G.g. - *Glomerella gossypii*
F.m. - *Fusarium moniliforme*
Rh.s. - *Rhizoctonia solani*
F.spp. *Fusarium* spp. (including *F. vasinfectum*)
Rh.b. - *Rhizoctonia bataticola*
D.g. - *Diplodia gossypina*

a/ Includes *Alternaria* spp., *Penicillium* spp., *Aspergillus* spp., and a few unidentified fungi.

Table 3. Number of seedlings from each State found with the various fungi.

Origin of Samples	Number of Samples	Total Number of Seedlings	Number of Seedlings Found with							
			G. g.*	F. m.	Rh. s.	F. spp.	Rh. b.	D. g.	Other Fungi	No Fungi
Alabama	49	1225	916	441	8	5	0	0	27	123
Arkansas	34	850	498	241	11	62	1	1	56	118
Georgia	84	1993	1053	679	19	69	5	1	186	358
Kentucky	5	125	74	25	0	1	0	0	14	33
Louisiana	60	1490	900	246	57	108	1	0	53	306
Mississippi	48	1195	810	268	14	182	9	0	59	114
Missouri	5	125	60	27	0	2	0	0	2	39
North Carolina	20	481	159	94	2	50	7	5	78	148
Oklahoma	17	189	0	11	0	9	2	2	60	105
South Carolina	104	2584	1431	870	42	180	4	4	168	440
Tennessee	7	175	73	54	0	21	0	0	4	39
Texas	4	65	0	0	0	33	0	0	8	24
Virginia	25	593	326	212	0	19	1	0	45	84
Total	462	11090	6300	3168	153	741	30	13	760	1931

* Abbreviations: See footnote, Table 2.

The results as presented in Tables 2, 3, and 4 show that Glomerella gossypii, which causes damping-off and anthracnose boll rot, was obtained more frequently than any other organism. G. gossypii was found in 413, or 89.4 percent of the 462 fields sampled, whereas Rhizoctonia solani, which is also known to be the cause of damping-off of cotton seedlings, was found only 61 times, or in 13.2 percent of the fields sampled (Table 2). It is of interest to note in Tables 3 and 4 that 6,300 or 56.8 percent of the 11,090 individual seedlings showed Glomerella gossypii, and only 153, or 1.4 percent, Rhizoctonia solani. This striking difference in relative abundance of the two fungi in samples and individual seedlings is probably explained by the fact that Rhizoctonia solani, a soil-borne organism, tends to occur in restricted portions of fields, whereas Glomerella gossypii, primarily seed-borne, is more evenly distributed.

Table 4. Percentage of seedlings from each State found with the various fungi.

Origin of Samples	Total Number of Seedlings	Percentage of Seedlings Found with							
		G.g.*	F.m.	Rh.s.	F. spp.	Rh.b.	D.g.	Other Fungi	No Fungi
Alabama	1225	74.8	36.0	.65	.41			2.2	10.0
Arkansas	850	58.6	28.4	1.3	7.3	.12	.12	6.6	13.9
Georgia	1193	52.8	34.1	.95	3.5	.25	.05	9.3	18.0
Kentucky	125	59.2	20.0		.8			11.2	26.4
Louisiana	1490	60.4	16.5	3.8	7.2	.07		3.6	20.5
Mississippi	1195	67.8	22.4	1.2	15.2	.75		4.9	9.5
Missouri	125	48.0	21.6		1.6			1.6	31.2
North Carolina	481	33.1	19.5	.42	10.4	1.5	1.0	16.2	30.8
Oklahoma	189		5.8		4.8	1.1	1.1	31.7	55.6
South Carolina	2584	55.4	33.7	1.6	7.0	.15	.15	6.5	17.0
Tennessee	175	41.7	30.9		12.0			2.3	22.3
Texas	65				50.8			12.3	36.9
Virginia	593	55.0	35.8		3.2	.17		7.6	14.2
Total	11090	56.8	28.6	1.4	6.7	.27	.12	6.9	17.4

* Abreviations: See footnote, Table 2.

Of the fungi isolated whose pathogenic effects are not so well known, Fusarium moniliforme occurred in nearly as many samples as did Glomerella. Next in order of frequency were Fusarium spp., of which F. vasinfectum represented about 70 to 80 percent. Other fungi isolated occasionally included Rhizoctonia bataticola, Diplodia gossypina, and common soil saprophytes such as Alternaria spp., Penicillium spp., and Aspergillus spp.

(Division of Mycology and Disease Survey and Division of Cotton and Other Fiber Crops and Diseases.)

TOBACCO SEED-BED SURVEY IN WISCONSIN, 1939

James Johnson

Owing to a rather cool and wet April the seed-beds were sown relatively late. Favorable weather in late May, however, forced the plants into a very fast growth and the planting season was comparatively early, beginning about June 1. Damping-off was very common in seed-beds, despite soil sterilization which is very commonly used. The operators of the soil-steaming outfits have generally reduced the time of steaming to 15 minutes from the 25 to 30 minutes originally recommended. Furthermore, the operators often advise the growers to only plow the seed-bed area before steaming instead of making the seed-bed practically ready for sowing before sterilization as recommended by the Experiment Station. As a result Pythium and Rhizoctonia either were not entirely eliminated from the soil or were reintroduced in the final preparation of the seed-bed. Consequently, heavy infection was noted in several seed-beds and relatively few were entirely free from damping-off this year, even though rainfall was deficient for the month of May.

Blackfire (Bacterium angulatum), which is almost universally present in some years, was either not present at all or was inconspicuous in the large majority of the seed-beds inspected. This situation was apparently due to unfavorable conditions for infection, since the preceding crop of 1938 was very heavily diseased with blackfire and the causal organism was, most likely, present in unusual abundance. It is estimated nevertheless that about 3 percent of the tobacco seed-beds in the State showed a moderate degree of blackfire infection as compared, for example, with 50 percent showing heavy infection in 1938. Wildfire (B. tabacum), however, was found in 12 seed-beds as compared to 8 in 1938, indicating again that this organism requires less favorable conditions for infection than does B. angulatum. The wildfire disease appears still to be limited to a district around Janesville and another district west of Edgerton, both being wildfire-infested areas for the past several years.

(Division of Tobacco and Plant Nutrition, Bureau of Plant Industry, cooperating with Wisconsin Agricultural Experiment Station.)

SOME OBSCURE PEACH DISEASES IN IDAHO

Earle C. Blodgett

I

In the Plant Disease Reporter 21: 89-95, 1937, attention was called to a peculiar disease affecting peach trees in certain sections of Idaho. At that time the tentative opinion was that the trouble appeared to be virus-like in nature but did not correspond to any familiar peach disease.

Attempts have been made to transmit the disease, but so far no satisfactory data are available. Observations have been continued, and although no detailed orchard mappings have been made, there is very good evidence of spread in an orchard. Similar symptoms have been noted on trees in widely scattered sections, and there is an alarming increase in severity of the condition.

While on a field trip, June 13-30, 1939, the writer had an opportunity to make further observations on orchards noted before, as well as to examine additional plantings. When the trouble was first noted in 1936, there had been the possibility of insect or soil or weather conditions producing the symptoms. While they are not ruled out completely, these causes are not probable. Many growers and keenly observant fruit inspectors consider the trouble to be due to winter injury. Winter injury, however, must be traced back two to four years, and this leaves a rather serious objection to the theory.

During the past year several notes have been published regarding the occurrence, definite or suspected, of "X" disease of peach, on peach or wild species of Prunus, in widely scattered areas of the United States. Considering all the information available and published descriptions of affected trees, it is suggested that these diseased peach trees show symptoms typical of "X" disease. In one orchard, French prune, sweet and sour cherry, apricot, and Italian prune have shown very peculiar symptoms, and there may be some relation to the diseased peaches nearby.

This note, however, should not be considered as a report of definite diagnosis of the presence of the "X" disease in Idaho. Correspondence is invited from those who are interested.

II

In September, 1938, a peach tree with peculiar, mottled foliage was noted in an orchard in Southern Idaho. The fruit appeared normal. Buds from the diseased tree were set on three healthy Slappy trees at Moscow, and in February one of the trees (potted) was moved into the greenhouse. Several of the buds grew and showed typical symptoms; in fact, the whole tree was similar in appearance to the diseased source of the buds. About a month later another tree was moved to the greenhouse, where it showed severe mottling of the foliage, although none of the diseased buds grew. Later in the spring the mottling on both budded trees was less distinct, and growth was poor. The other tree budded in the Station orchard at Moscow showed typical mottling on leaves when they appeared in May.

On June 23 the writer examined the original tree, and it appeared just as it had the year before. A careful survey in the orchard failed to show other trees affected in a similar way, but there was severe injury of a type characteristic of that described for "X" disease. The leaf symptoms of this particular tree appeared to be similar to peach mosaic, but the fruit appeared normal (variety not definitely known), and there was apparently no natural spread of the disease. There is reason to believe that this peculiar, mottled condition has been present on this tree since it was planted about ten years ago. The primary symptoms on the budded trees in the greenhouse corresponded to those of peach mosaic.

III

In June, 1938, a collection of peach fruits with a peculiar trouble was sent in for diagnosis. Very young fruits show the condition, and they do not recover, although the injury is milder when the fruit is mature. The symptoms appear as blisters or raised welts on or near the stylar end, often involving half or more of the fruit. The peach may be misshapen and slightly dwarfed. It has been observed that a brown, corky material forms on these welts and persists, and gumming is common. If a diseased fruit is cut open, the flesh is more spongy or open than that of a normal peach, probably because of the gum pockets which then exude the liquid in large quantities. The trees appear normal, and the foliage is healthy, except in one case the leaves were a denser green.

No description of a similar trouble has been found and, hence, no established name. Peach blister seems appropriate. The trouble has now been found in seven widely scattered orchards, usually with only one tree affected. All the fruit on a tree is diseased, although severity varies greatly. There is as yet no evidence that the trouble spreads, and transmission studies have not yielded data on this point.

The disease is spectacular in its appearance on the peaches and has caused considerable concern--so far mostly curiosity among growers. It is very desirable to contact anyone who is acquainted with the condition.

(Idaho Agricultural Experiment Station.)

FIRST REPORT OF THE POPCORN DISEASE OF MULBERRY IN ARKANSAS

John C. Dunegan and E. J. Allen

Specimens of the popcorn disease of mulberry (Morus alba) caused by Sclerotinia carunculoides were received from Warren, Bradley County, Arkansas on June 30, 1939. The owner stated that this disease had rendered worthless, as food for hogs, the entire crop of 60 white mulberry trees in 1937, 1938, and 1939.

This disease hitherto has not been observed in Arkansas. However, according to Jenkins and Seigler 1/ it has been collected at Leland, Mississippi, 66 miles southeast, and at Homer, Ruston, and Shreveport, Louisiana, points between 70 and 124 miles southwest of Warren, Arkansas.

(Division of Fruit and Vegetable Crops and Diseases, U. S. Bureau of Plant Industry, and Arkansas Agricultural Experiment Station.)

VEGETABLE DISEASE NOTES IN NEW YORK

Charles Chupp

On June 29, a survey was made of a number of pea fields in the Geneva-Hall district of Ontario County, New York. Nearly all of these fields were severely injured by virus diseases. Some fields were completely destroyed. With the help of Dr. H. T. Osborn, it was determined that the three viruses causing the trouble were pea virus No. 1, virus No. 2, and streak. Virus No. 2 caused very little injury. Streak was damaging a large percentage of the plants in one field, and was present to a slight extent in several others. But nearly all the loss was caused by pea virus No. 1 which was present on nearly every plant in most of the fields that were inspected. An attempt was made to determine the source of the inolulum, but no clue was discovered that might explain the sudden and severe epidemic in this particular area.

1/ Jenkins, A. E., and E. A. Seigler. Distribution of popcorn disease of mulberry. Plant Disease Reporter 22: 435-438, 1938.

Another trouble which has not been observed before is the root rot of squash plants. Specimens have been sent from Columbia, Albany, Schenectady, Onondago, Herkimer, and Madison Counties. Apparently, the infection follows some type of injury: insect feeding, wind whip, fertilizer burn, or mechanical injury. In some cases, Erwinia carotovora follows such injury and in other cases, a species of Fusarium. In either case, the root turns brown and finally decays. The plant wilts in a manner similar to that of bacterial wilt, after which it dies. The amount of injury reported varied from a few hills to most of a given planting.

A third vegetable disease of interest is muskmelon mosaic, which is worse at the present time than it has been for several years.

(Cornell University. July 13.)

INCIDENCE OF POTATO LEAFROLL ON LONG ISLAND

W. G. Been

During the middle of June, Dr. K. H. Fernow, Dr. H. S. Cunningham, and the writer inspected over 200 Suffolk County potato fields on 74 farms. Accurate counts were made of virus disease infection and percentage of missing hills. With the exception of leafroll, relatively small amounts of disease were found. Leafroll infection was severe, particularly in Green Mountain seed from Central Maine. Average amounts of leafroll found in certified seed from the important sections are as follows:

In Green Mountain -- Maine, 27 percent; New York, 9 percent; Prince Edward Island, 7 percent; Vermont, 7 percent.

In Chippewa -------- Maine, 19 percent; New York, 11 percent; Wisconsin, 41 percent.

This survey proved definitely that the cause of our so-called hairsprout condition on the Island is leafroll.

(From New York State College of Agriculture Weekly News Letter, July 10.)

CEREAL DISEASES IN OREGON AND ADJACENT WASHINGTON IN 1939

Roderick Sprague

Owing principally to nine weeks of drought ending in late May, the cercosporella footrot (Cercosporella herpotrichoides Fron) caused very little damage in the region of the Columbia Gorge. Take-all (Ophiobolus graminis) is very scarce in the Willamette Valley this year. The so-called "short smut" (Tilletia tritici), which causes excessively short culms in the High Prairie area in Klickitat County, Washington, is also very scarce. Fields that two years ago showed 75 percent infection in certain portions, this year have about 0.5 percent infection.

A somewhat unusual phase of Rhizoctonia and Fusarium rootrot of spring-sown barley has been reported from Benton, Lane, and Washington Counties, Oregon. The disease appeared after a series of rains that broke the dry spell and permitted the barley to emerge from the previously very dry soil. The leaves of infected plants became yellow, and the culms became stiff and purple, and the bases brown. Vague eye-spot lesions occurred commonly on the leaf sheaths. The Rhizoctonia sheath lesions were deep enough to kill the outer leaves and to interfere with the growth of the plant. Fusarium sp. (probably F. culmorum) followed on the roots and crowns so that the injured plants became stunted and many ceased to grow. The injury was sometimes confined to large circular spots in the field, from 50 to 200 feet across. In other instances, the disease occurred as streaks, sometimes without reasonable explanation. In some fields the grain made partial recovery after about three weeks; in others the injury was permanent and the loss heavy.

This injury was definitely associated with infertile, red, hill soils, or colluvial soils partly derived from the hill soils. R. E. Stephenson tested samples and determined that those from fields showing greatest rootrot injury were extremely low in phosphorus, and that their reaction was P_h 4.9.

Isolations yielded Rhizoctonia (?) solani and Fusarium sp. Rhizoctonia mycelium is readily found in the sheath spots and has the same appearance as that of the common brown-patch organism of lawns in this region.

The presence of Rhizoctonia on cereals in Oregon, outside of the coastal region, was first reported last year. This present situation indicates further spread of the disease. Its presence in the Willamette Valley is a point to be considered in crop rotation. Indications point to the value of leguminous crops with the addition of superphosphate to eliminate the disease as an economic factor. Barley is an exceedingly poor crop to grow in the acid soils harboring the rootrot complex.

There was a small amount of leaf rust [Puccinia rubigo-vera tritici] on wheat in the Willamette Valley but no stem rust [P. graminis] has been reported. Stripe rust [P. glumarum] was found on Elymus glaucus but only traces were noted on cereals.

Septoria tritici Rob. was, as usual, exceedingly common on wheat in the Willamette Valley and adjacent areas. It was noted that late wheats, such as Holland, had considerably less spotting than such wheats as Hybrid 128, Albit, or Rex in the Columbia Gorge area.

Powdery mildew [Erysiphe graminis] was very common on barley this season in the Willamette Valley and was serious even on spring-sown barley.

(Division of Cereal Crops and Diseases, Bureau of Plant Industry, cooperating with Oregon Agricultural Experiment Station. Contribution from Department of Botany, Oregon State College. July 5.)

JUNE WEATHER

(From U. S. Dept. Agr. Weather Bureau, Weekly Weather and Crop Bulletin for week ending July 4.)

June, 1939, was characterized by moderately warm weather generally, except for subnormal temperatures in the far Northwest, while most areas east of the Rocky Mountains had above-normal rainfall. From the Rockies westward the month was very dry, except locally.

Figure I shows that throughout the southern half of the country the temperatures for June averaged above normal, with plus departures ranging mostly from 1° to as many as 6°; also, in most of the Interior Valleys, the Lake Region, and the middle Atlantic area. The monthly means were slightly below normal locally in the Northeast and in a considerable northwestern area, with the largest minus departures, 3° to 5°, in western North Dakota and Montana.

Figure II shows that a few localities in the west Gulf area, Mississippi Valley, the Southeast, and the Northeast had below-normal rainfall; otherwise east of the Great Plains the monthly totals were above normal. Rainfall was heavy in the western Lake region, the Ohio Valley, and much of the southern Great Plains. Also, the northwestern Plains received considerably more than normal. However, in the extreme western Plains, the central and southern Rocky Mountain areas, and the Great Basin the amounts were decidedly scanty, with a considerable southwestern area receiving no measurable rainfall for the entire month.

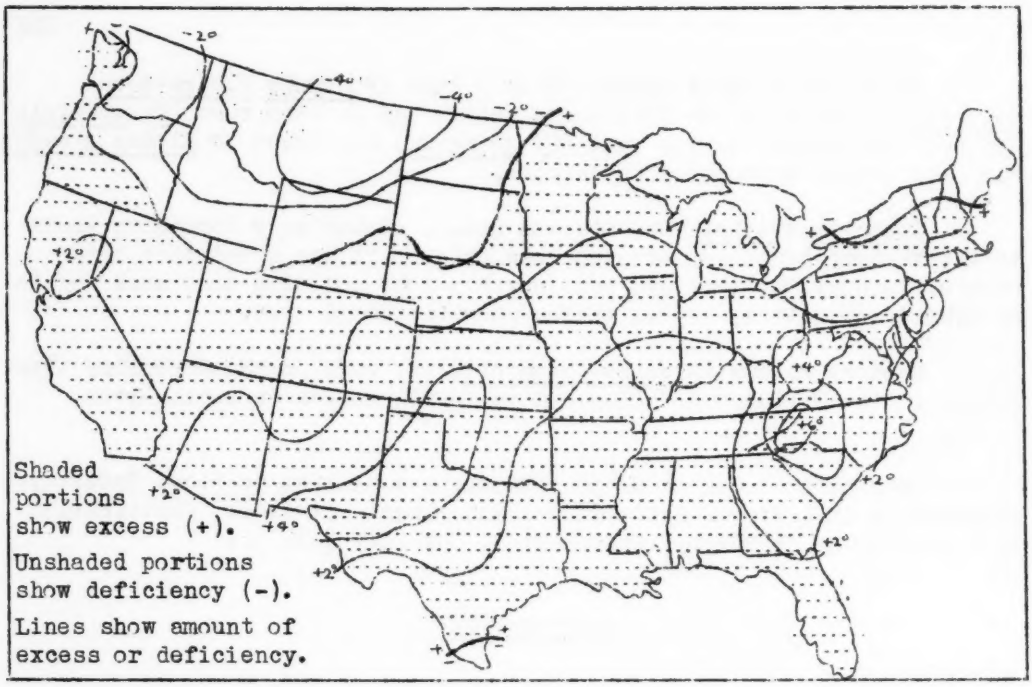

Figure 1. Departure of mean temperature from the normal for June 1939.

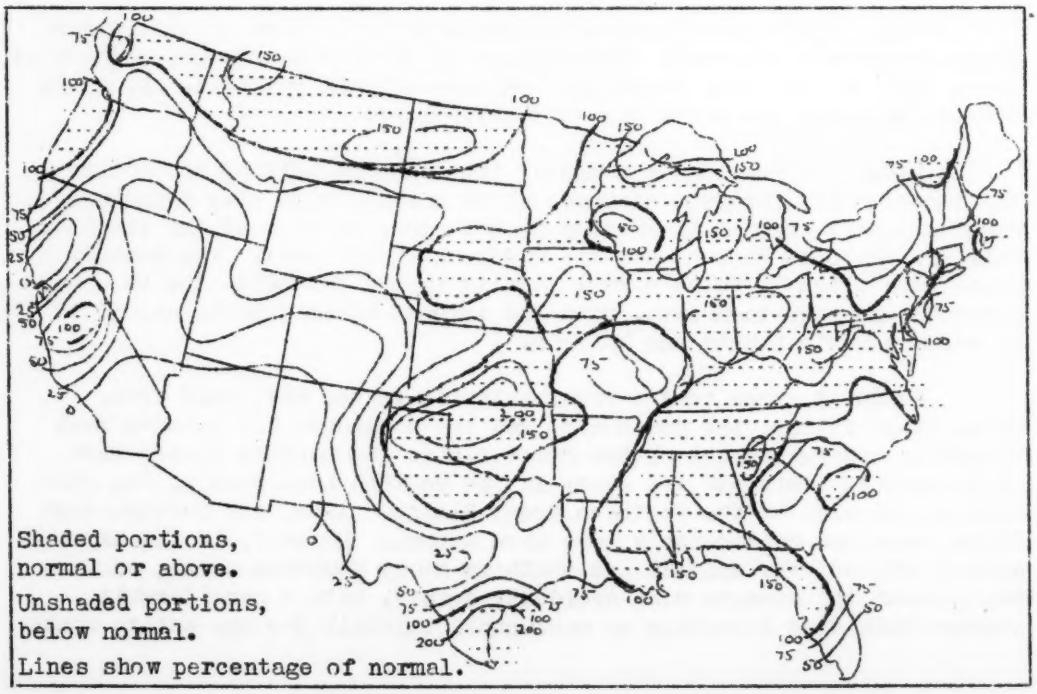

Figure 2. Percentage of normal precipitation for June 1939.

BACTERIAL RING ROT OF POTATO IN OREGON

C. E. Owens

We have just returned from Ontario in eastern Oregon where there is a severe outbreak of bacterial ring rot [Bacterium sepedonicum] on potatoes. Some fields show from 1 to 5 percent of infected plants. Digging and shipping of new potatoes is in progress and in many of the washing and sorting sheds at shipping points a considerable number of tubers showing various stages of the rot can be found by careful inspection.

There is some evidence that ring rot appeared in this locality in smaller amounts last year but it was not recognized and definitely diagnosed as such.

(Oregon Agricultural Experiment Station.)